

Work Order ID 61351

August 19, 2010 9:24:40 AM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 8/19/10 Start Qty: 1.00



Cust Item ID:

Required Date: 9/06/10 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: CZ Date: 10/8/19 Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
----------	--------------

D2580	Rev D
-------	-------

100

0.00



DC

DOCUMENT CONTROL

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

10-10-04
①

110

0.00



CNC Bend 1

BENDING MACHINE - SKIDTUBES

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

10-9-14

61351

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

4- Scribe batch number insied aft end of tube.

BB/10/09/15

130

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

1 - BE 10/09/15

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Weld step D2576 as per Dwg. D2580 and QSI 004
A/R□□□ Aluminum Rod

M114877

BE 10/09/10

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill
A/R□□□ Aluminum Rod

M114877

BE 10/09/10

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

DP 10-9-22

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",
adjust stopper not to hit web. Debur

BB 10/09/22

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580.
Debur holes

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Debur

DP 10-9-23

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Debur

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

150

QC10- Inspect visual per QSI004- ground welds

0.00

S 10/01/24



QC

Memo

0.00

Quality Control

160

QC5- Inspect part completeness to step on W/O

0.00

S 10/01/24

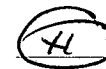


QC

Memo

0.00

Quality Control



170

Pressure Wash per QSI005 4.3

0.00

BK 10-9-27



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.



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Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180



Powdercoat

Powder Coating

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00

10-9-28

M115 291

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

8:45
320°
9:15

0.00

①

190



QC

Quality Control

QC3- Inspect Part Finish

0.00

=> M 10/9/29

Memo

0.00

1 d

W/O:		WORK ORDER CHANGES					
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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

200

0.00

⇒ Hl 10109129

1

Ø

HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of

Sikaflex on insert holes before installing wearplates

✓ A/R ☐ ☐ ☐ Sikaflex-291 ☐ M11511 ☐

Sikaflex expire date: 11/01

✓ 2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

✓ 3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with

Sikaflex. Clean excess adhesive

✓ A/R ☐ ☐ ☐ Sikaflex-291 ☐ M11511 ☐

Sikaflex expire date: 11/01

✓ 5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: M115028

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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

0.00

Memo

Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024

8/10/09/09

70

220



Packaging

Packaging

Packaging

0.00

0.00

Memo

Identify and pack for shipping as per PPPD205-634-041

Location: 73
PPP Rev: I

10/10/10

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

0.00

Memo

10/10/04

MF
10-10-01

Picklist Print

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Work Order ID: 61351

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ
IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD
IPP Rev. O 06.02.28 Added paperwork EC
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D2580-1 Manufactured No

110

Each

5.0000

1

1



205 Skidtube bent detail

Location	Loc Qty	Loc Code
LG	4	
57028	1	
60956	1	
61191	2	
ST046	1	
59856	1	

① DP 10-9-14

D2576-3 Manufactured No

140

Each

84.0000

1

1



Step (maching detail)

Location	Loc Qty	Loc Code
LG	84	
46661	36	
52215	48	

1 BE 10-9-10

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Work Order ID: 61351



Parent Item: D205-634-041



Parent Item Name: Replacement Skidtube

Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

D2579 Manufactured No 140 Each 295.0000 20 20



Crossbolt Spacer

Location Loc Qty Loc Code

LG	295	
57052	5	
57348	4	
58433	2	
59113	182	
60845	102	

20 OF 10/09/10

D2855 Manufactured No 200 Each 77.0000 1 1



Cap

Location Loc Qty Loc Code

FP6	1	
56613	1	
ST026	76	
50513	1	
50770	28	
51539	2	
53791	45	

x1

AN3-5A Purchased No 200 Each 1,534.000 2 2



Bolt

Location Loc Qty Loc Code

ST350	1534	
105057	534	
115016	500	
115371	500	

x2

21 10/09/29

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Page 2

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Page 3

Work Order ID: 61351

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube

Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

AN960JD10L NAS1149D0332J Purchased

No

200

Each

2,623.000

2

2



HL 10/09/29

Washer

Location

Loc Qty

Loc Code

ST348

2623

110985

2623

M114348

Y2

ALS7-1032-130 Purchased

No

200

Each

878.0000

50

50



HL 10/09/29

Insert

Location

Loc Qty

Loc Code

FP

861

115079

861

ST282

17

113238

17

M114723

A50

AN3C4A Purchased

No

200

Each

1,991.000

50

50



HL 10/09/29

BOLT

Location

Loc Qty

Loc Code

ST303

500

115438

500

ST350

1491

114108

14

114416

12

114523

2

114941

463

115300

1000

Y50

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Parent Item Name: Replacement Skidtube

Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

AN960C10L NAS1149C0332 Purchased No

200 Each 29.0000 50 50



washer



41 10/09/29

Location

Loc Qty

Loc Code

ST245

29

107534

29

M115698

x50

D3566-13 Manufactured No

200 Each 26.0000 1 1



Gasket



41 10/09/29

Location

Loc Qty

Loc Code

FP012

26

5966J

18

60209

8

x1

D3566-5 Manufactured No

200 Each 30.0000 1 1



Gasket



41 10/09/29

Location

Loc Qty

Loc Code

FP

22

60869

22

FP015

8

59158

8

x1

D3566-1 Manufactured No

200 Each 19.0000 2 2



Gasket



41 10/09/29

Location

Loc Qty

Loc Code

FP

5

60857

5

FP015

14

57715

2

60202

12

B61656

x2

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Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

D3564-11 Manufactured No

200

Each

4.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP019

4

B60302

59941

4

X1

D3564-13 Manufactured No

200

Each

23.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP17

23

59660

11

60862

12

V1

D3564-9 Manufactured No

200

Each

20.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP

1

55334

1

FP019

19

59201

6

60236

13

X1

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Start Date: 8/19/10

Required Date: 9/06/10

Start Qty: 1.00

Required Qty: 1.00

D3564-5 Manufactured No

200

Each

21.0000

1

1



Wearshoe



HL 10109129

Location

Loc Qty

Loc Code

FG
34806
FP19
57525
58709
FP-19
59157
60868

1
1
2
1
1
18
6
12

X1

D2594-3 Manufactured No

200

Each

275.0000

16

16



O-Ring, 205 Skidtube



HL 10109129

Location

Loc Qty

Loc Code

FP
55546
58191
59358

275
19
12
244

M 61762

X16

D2594-1 Manufactured No

200

Each

355.0000

16

16



Plug, 205 Skidtube



HL 10109129

Location

Loc Qty

Loc Code

FP
42807
55002
FP14
58434
59110

183
112
71
172
15
157

B 61932

X16

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DART

DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

RELEASED
07-06-28 *[Signature]*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 061351
02/08/19

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
SEE NOTES ON
PAGE 2 FOR D2580-041 AND
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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07-06-28

Diagram illustrating the grinding locations for the D2576-3 step. The diagram shows a cross-section of the step with the following labels:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- GRIND FLUSH
- LOCATION RIDGE ON UNDERSIDE OF D2576
- $\frac{1}{4}$

Diagram illustrating the assembly of a bolted joint. The components and dimensions are labeled as follows:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)**: Points to the two locations where the cap is installed.
- SEAL WITH SIKAFLEX-241/-291**: Points to the sealant applied around the bolt head.
- AN3-5A BOLT (1)**: Points to the bolt used for assembly.
- AN960JD10L WASHER (1)**: Points to the washer used for assembly.
- D2855 CAP**: Points to the cap used for assembly.
- 0.40**: Dimension indicating the distance from the center of the bolt to the edge of the cap.

D2579 SPACER

D2596 WEB (REF)

ALS7-1032-130 (REF)
(TYP 50 PLACES)

AFTER PERFORM

1. CHA
2. INSU
3. WEL
4. C'B

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Elevation view of the bridge deck showing reinforcement details. The drawing includes dimensions for the distance from the end of the web to the first reinforcement bar (37.50), the spacing between bars (8.750, 17.375, 26.000, 34.188), and the total length of the deck (91.500). Reinforcement bars are labeled as #0.508 (TYP.) (40 PLACES) and REFER TO DETAIL A.

D3560-041 ASSEMBLY DETAIL

WELD AS PER DETAIL B

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

0.5

1.5

1.5

1.5

8

P P P P P P P P

D

D

REFER TO DETAIL C

D3566-1

D3566-5

D3566-1

D3566-13

D3564-11

D3564-5

D3564-9

D3564-13

AN3C4A BOLT (1)





AN960C10L WASHER (1)

(50 PLACES)

DESIGN	JJ	DRAWN BY	
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i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

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DATE			
07.02.27			

DRAWING NO.	REV. D
D2580	SHEET 2 OF 3
TITLE	SCALE
205 SKIDTUBE ASSEMBLY	1:24

RELEASED
07 Dec 28

Diagram illustrating the grinding locations for the propeller cross-section. The diagram shows a cross-section of a propeller with the following labeled areas:

- GRIND FLUSH (4 PLACES)
- GRIND FLUSH
- D2576-3 STEP
- LOCATION RIDGE ON UNDERSIDE OF D2576

Diagram illustrating the rear view of the antenna assembly. The diagram shows the mounting bracket, bolts, and the application of sealant (SIKAFLEX-241/-291) around the mounting points. The following components and dimensions are labeled:

- DRILL PRIOR TO D2855 CAP INSTALLATION (2 PLACES)
- SEAL WITH SIKAFLEX-241/-291
- AN3-5A BOLT (1)
- AN960JD10L WASHER (1)
- (2 PLACES)
- D2855 CAP
- SEE NOTE ii)
- 0.40

Diagram of a wheel assembly with labels:

- D2579 SPACER
- D2596 WEB (REF)
- ALS7-1032-130 (REF) (TYP 50 PLACES)
- AFTER PERFORM
- 1. CHA
- 2. INS
- 3. WE
- 4. C'B

AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (20 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO $\phi 0.437$ X 1.00 DEEP

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[illegible][illegible]

D3566-049 ASSEMBLY DETAIL

WELD AS PER DETAIL F

BLACK ANTI-SKID TO 0.5 ABOVE LOCATION RIDGE

BLACK ANTI-SKID TOP OF STEP TO 0.5 ABOVE BOTTOM EDGE

NO C'BORE NO PLUG

8

REFER TO DETAIL G

0.5

1.5

H

P

1.5

1.5

NO C'BORE NO PLUG

D3566-1

D3566-5

D3566-1

D3566-13

D3564-11

D3564-5

D3564-9

D3564-13

AN3C4A BOLT (1)

AN960C10L WASHER (1)

(50 PLACES)

DESIGN	DRAWN BY	
--------	----------	--

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

ii) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE
WITH THE SPACER AT THIS LOCATION

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07.02.27

205 SKIDTUB

ASSEMBLY

NO. 238

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 61352
Part number: D205-634-041
Description: 205 skid tube
Welding Process: Tig[☒] Mig[]
Base material: Aluminium
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier Pat. D. L. Date of Test Coupon 10.08.25
Welder Barclay Elliott Date of Test Coupon 10.09.25

The above named individual is qualified in accordance with AWS D17.1.2001 to weld